

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
20 January 2005 (20.01.2005)

PCT

(10) International Publication Number
WO 2005/006812 A1

(51) International Patent Classification⁷: **H05B 3/64**

(21) International Application Number: **PCT/SE2004/001048**

(22) International Filing Date: 29 June 2004 (29.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0302047-6 10 July 2003 (10.07.2003) SE

(71) Applicant (for all designated States except US): **SANDVIK AB [SE/SE]**; S-811 81 Sandviken (SE).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **LEWIN, Thomas** [SE/SE]; Bergslagsvägen 227 B, S-734 40 Hallstahammar (SE).

(74) Agents: **ÖRTENBLAD, Bertil et al.; NORÉNS PATENT-BYRÅ AB**, Box 10198, S-100 55 Stockholm (SE).

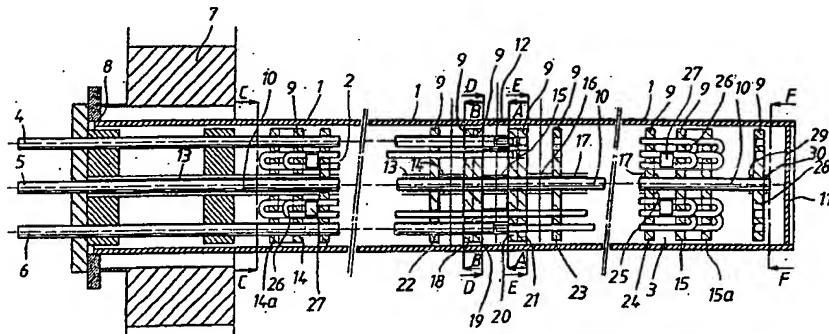
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **AN ELECTRIC HEATING ELEMENT THAT INCLUDES A RADIANT TUBE.**



WO 2005/006812 A1

(57) Abstract: An electric heating element with radiant tube comprising a radiation pipe (1) and an electric heating element (2, 3) contained in said pipe, wherein the heating element has legs that run to and fro in the pipe, and wherein the heating element is connected at one end of the pipe close to a furnace wall with electric power outlets through which electric current is fed to the element, wherein the element is supported in the pipe by supportive ceramic discs (9) that are provided with through-penetrating holes through which respective legs extend, and wherein two heating elements (2, 3) are disposed sequentially in said radiation pipe along its long axis. The invention is characterised in that a central rod (5) extends through the centre of the radiation pipe (1) from its one end (8) to its other end (11) and also through the centre of each supportive disc (9); in that the central rod forms an electric power outlet for at least one of said heating elements (3); in that a connection region (12) for said two heating elements in the radiation pipe is situated between the elements in the longitudinal direction of the pipe (1), wherein respective elements are connected to their respective power outlets (4-6) in said connection region; in that the heating element includes stop means (13-17) which function to generally retain ceramic discs (18-23) present in the connection region in a direction along the long axis of the pipe; and in that supportive ceramic discs (9) for supporting respective elements are placed at a distance from said connection region (12), wherein at least some of said ceramic discs (14-15) are able to move freely along the pipe (1) to an extent allowed by element-related stop means (27) as respective elements expand or contract in response to a change in the temperature of said elements.